RAND/USGS Planetary Geodesy (RUPG) Software

RANDLSQ Program A Priori Input format

File: RUPG-FMT5011.doc

Version: 2004.08.09

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Description: Primary input of a priori information, such as approximate
positions for the body pole position and rotation rate, control point positions,
and camera position and orientation.

File input:

Group 1 – Pole position and rotation rate (1 record):

Name   Columns   Format   Description (units)

alpha0   1-24   D24.16   J2000.0 right ascension of target body north
pole, e.g. alpha sub zero (degrees).

delta0   25-48   D24.16   J2000.0 declination of target body north
pole, e.g. delta sub zero (degrees).

Wdot   49-72   D24.16   Target body rotation rate (degrees/day).

Sample (from Mars solution, inp0014-030606.dat):

=> 0.3176814300000000E+03 0.5288650000000000E+02 0.3508919822600000E+03   <=

Group 2a (if SOLVEFOR parameter = "ELLIPS" and "isol"=3, note 2)

aa   Semi-first axis of ellipsoid.

bb   Semi-second axis of ellipsoid.

cc   Semi-third axis of ellipsoid.

Group 2b (same)

lam0   Longitude offset of ellipsoid (degrees).

Sample (from Io solution, winp_031106b.dat):

=> 0.1829400000000000D+04 0.1819300000000000D+04 0.1815700000000000D+04<=
=> 0.0000000000000000D+00<=

Group 3 – Control point locations ("npoi" records, note 3):

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Phi           1-24       D24.16      Latitude of control point (degrees).

Lamda         35-48      D24.16      Longitude of control point (degrees).  If
iew=0, then east longitude.  If iew=1, then west longitude.

Radius        49-72      D24.16      Radius of control point (meters or km?).

Pointid       73-79      2X,A5       Point identification (unitless).


Sample (from Mars solution, inp0014-030606.dat):

=>  0.1909490000000000E+02  0.332527999999998E+02  0.3389810000000000E+04    M1<=



Group 4 – Camera orientation and position (3 x "npic" records, note 4):

Record 4-1:

JulianDate  1-24       D24.16      Julian date when picture was taken (days).

Imageid     25-36      A12         Image identification.  Usually flight data
sequence (FSC) or similar image number (unitless).

-           65-79      A15         "JULIAN_DATE&FDS".

Record 4-2:

s(i,1)      1-24       D24.16      X component of spacecraft position vector in
J2000.0 coordinates (km).

s(i,2)      25-48      D24.16      Y component of spacecraft position vector in
J2000.0 coordinates (km).

s(i,3)      49-72      D24.16      Z component of spacecraft position vector in
J2000.0 coordinates (km).

-           74-79      A6          "SXSYSZ".

Record 4-3:

c(i,1)      1-24       D24.16      J2000.0 right ascension of optical axis of
picture (degrees).

c(i,2)      25-48      D24.16      J2000.0 declination of optical axis of
picture (degrees).

c(i,3)      49-72      D24.16      Twist angle of picture (degrees).

-           74-79      A6          "C1C2C3".


Sample (from Mars solution, inp0014-030606.dat):

=>  0.2441301988760300E+07   03930825                  JULIAN_DATE&FDS<=
=> -0.8661226663487074E+04  0.5921060362637615E+04  0.1870542969447505E+03 SXSYSZ<=
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=> 0.3264084087609089E+03 -0.3653454614625757E+01 0.4672074705998713E+02 C1C2C3<=

Notes:

1. Currently read from RANDLSQ program unit 12.
2. If the runstring parameter "SOLVEFOR" = "ELLIPS" and "isol" = 3, then group
2a is read. (For the weighter2 program, "isol" = 3 only.) See the "Solution
Parameterization" file (format RUPG-FMT5031.doc") for input of this.
3. "npoi" is the number of control points. See the "Solution Parameterization"
file (format RUPG-FMT5031.doc") for input of this.
4. "npic" is the number of images. See the "Solution Parameterization" file
(format RUPG-FMT5031.doc") for input of this.
5. Lines beginning with a "#" will eventually be treated as comments.
6. IMPORTANT: See format "RUPG-FMT5012.doc" for Lunar measurement files (e.g.
measures from Lunar Orbiter, Apollo, Mariner 10, Galileo, Clementine lunar
images), using 7 character Pointid.

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Reference: Model, program, and format generally follow that specified in:

Colvin, Tim R. (1992). "Photogrammetric Algorithms and Software for Spacecraft
Optical Imaging Systems," _ A RAND NOTE _, N-3330-JPL.

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Document History:

Begun 2004.08.09 by B. Archinal

Modifications:

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